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ABSTRACT

A large body of research, especially from the 1990s, demonstrates the positives of Career and Technical Education (CTE). The research shows that associate degree holders enjoyed average earnings 20-30 percent higher than high school graduates (while baccalaureate degree holders had average earnings 30-40 percent higher than those of high-school graduates). Some data showed slight benefits for certificates, although no research is available on the benefits of proprietary certificates, such as in computer software. Apprenticeships led to 20 percent higher earnings for black and white men, while Hispanic men enjoyed earnings about 35 percent higher. Women showed no income advantage from apprenticeships. Although two-year-degree holders had higher average earnings, income varied by field of study, with those in academic fields showing the lowest gains and those in technical fields showing higher gains. For women, two-year degrees in business and health-care fields led to the highest gains. In addition, persons who found employment related to their field of study reaped the greatest earning benefits, both at the associate and at the baccalaureate degree level. A recent (2000) National Center for Education Statistics study also found that high school students with a combined vocational concentration and a college preparatory curriculum academically out-performed vocational only concentrators and were statistically indistinguishable from those who completed a college preparatory curriculum only. (Contains 14 references.) (KC)

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IN Brief
Fast Facts for Policy and Practice
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National Dissemination Center for Career & Technical Education

by Michael E. Wonacott

CTE Contributions to Learning and Earning

Many CTE practitioners believe passionately in the quality and effectiveness of their programs as an avenue both to further education and to work. Others disagree, maintaining that only the high school college preparatory curriculum and a 4-year baccalaureate degree produce economic and educational outcomes appropriate for the high-tech, high-performance workplace. This ***In Brief*** reviews the literature and research on the learning and earning benefits of CTE.

Earning

A large body of evidence demontrates that higher educational attainment leads, on average, both to higher annual earnings and to a lower likelihood of unemployment ("More Education" 1999). In the past, unfortunately, information on the economic benefits of CTE has been less clear. The reliability of institutional follow-up mail or telephone surveys has been limited by low response rates, lack of control groups, self-reporting, and cross-sectional, short-term design; furthermore, findings were limited to the single institution conducting the survey (Azari 1996). National data and analyses correlating educational attainment with educational and employment outcomes have typically lumped together all students who began postsecondary education but did not attain a baccalaureate degree into a single category—"Some college, no degree"—that fails to distinguish those who have completed important CTE credentials such as occupational licenses, certificates, or associate degrees (Grubb 1999; Sanchez and Lanaan 1997).

In the 1990s, however, new national data sets became available with more results in greater detail (ibid.; Kerckhoff and Bell 1998). In addition, some states and individual postsecondary institutions have begun analyzing Unemployment Insurance (UI) wage record data to determine the effects of postsecondary education (Azari 1996; Grubb 1999; Luan 1996; Sanchez and Lanaan 1997), although UI systems do not contain data on individuals who are self-employed, employed out of state, or not in the labor force. These newer analyses provide considerable evidence of the earnings benefits of subbaccalaureate CTE.

The benefits of associate degrees. Grubb (1999) reviewed national studies on the economic benefits of subbaccalaureate education and credentials. In general, most analysts he cited found that controlling for other differences, associate degree holders enjoyed average earnings 20-30 percent higher than those of high school graduates; in comparison, baccalaureate degree holders had average earnings 30-40 percent higher than high school graduates. Grubb's review found that subbaccalaureate returns, like baccalaureate returns, were usually somewhat higher for women than for men and higher for earnings than for wages (because associate degree holders also had reduced likelihood of unemployment).

The benefits of certificates. Some data on the benefits of postsecondary occupational/technical certificates suggested a zero return for both men and women; other data, however, suggested returns for both men and women that were significant but slightly lower than those for an associate degree (Grubb 1999; Kerckhoff and Bell 1998). There appear to be few if any data on the benefits of the industry-sponsored certificates that some secondary CTE programs offer; nor is information available on the benefits of the proprietary or professional certificates (e.g., Microsoft, Novell, Cisco, A+) that conventional wisdom considers very lucrative.

The benefits of apprenticeships. Rivera-Batiz (1998) examined the labor market outcomes associated with different post-high-school education and training programs for persons participating in Job Training Partnership Act programs, applying for jobs through the employment services system, or filing unemployment compensation claims. Among non-Hispanic black and white men, those who participated in an apprenticeship program had earnings about 20 percent higher; Hispanic men enjoyed earnings about 35 percent higher. However, no statistically significant connection was found between apprenticeship and earnings for women of any racial or ethnic group.

The effects of field of study and gender. Of course, not all associate degrees are CTE credentials; many are in academic areas. So, what can we say about CTE associate degrees? Grubb's (1999) review found that the benefits of associate degrees, like those of baccalaureate degrees, varied by field of study. For the most part, Grubb found earnings benefits that were either statistically insignificant or small for associate degrees in academic subjects, which roughly parallels lower earnings benefits for baccalaureate degrees in academic areas, whereas the earnings benefits of associate degrees were significant and substantial in certain occupational/technical areas.

However, those significant and substantial earnings benefits of associate degrees in certain technical/occupational areas varied considerably by gender (Grubb 1999). For men, associate degrees in engineering, computer fields, engineering, and "vocational/technical" subjects brought the highest earnings benefits; women earned more with associate degrees in business and health-related occupations. Similar gender differences affected the economic benefits of certificates and apprenticeships (Rivera-Batiz 1998). Those gender differences were much more pronounced than for baccalaureate degrees, possibly reflecting more powerful and widespread gender patterns in subbaccalaureate occupations (Grubb 1999; ibid.).

In fact, Grubb pointed out that earnings benefits of associate and baccalaureate degrees overlap. Although baccalaureate degrees brought higher *average* earnings than associate degrees, the highest-earning associate degrees brought greater earnings benefits than baccalaureate degrees in low-paying fields like humanities or education. Grubb theorized that this overlap in benefits accounted for the "reverse transfer" phenomenon, in which baccalaureate degree holders return to 2-year occupational/technical programs.

The effects of related employment. The economic benefits of CTE and CTE credentials depend on whether or not the individual found employment related to the field of study (Grubb 1999):

- Individuals who found employment related to their field of study enjoyed the greatest earning benefits, both at the associate and baccalaureate degree level.

- Individuals with academic degrees—both associate and baccalaureate—had the next highest level of earnings.
- Men with occupational/technical associate degrees who had employment *not* related to their field of study had the lowest increase in earnings compared to high school graduates.
- Women with occupational/technical associate degrees who had employment *not* related to their field of study had only a slight and statistically insignificant increase in earnings compared to high school graduates.

The effects of program completion. As a general rule, there are benefits to *completing* programs and obtaining credentials, either academic or occupational/technical; program completers earn more than noncompleters with comparable college credits (Boesel and Fredland 1999; Grubb 1999; "More Education" 1999). Nevertheless, accumulating course credits without completing a program and acquiring a credential sometimes brought benefits, although the picture was less certain and the benefits appeared to be smaller than those generated by the same amount of course credits capped by a credential (Grubb 1999). In addition, a fairly substantial amount of course work (1-2 years) may be necessary before any earnings benefits were realized.

The effects of the local labor market. In general, the results of nationwide analyses were confirmed by analyses of UI wage record data (Grubb 1999) and by more traditional follow-up mail and telephone surveys (Community College of Rhode Island 1998; Illinois Community College Board 1997). Grubb (1999) theorized that differences between national and state analyses could be explained by the more local nature of the subbaccalaureate labor market, with more employers looking for workers and more students looking for jobs locally, closer relationships between local employers and educational providers, and the effects of local economic conditions.

Learning

CTE practitioners are probably accustomed to seeing research reports that show lower academic achievement for CTE students. Just as one example, the National Center for Education Statistics (NCES) (2000) reported that 1992 public high school graduates with only a vocational concentration showed significantly lower test score gains in reading, math, and science than those graduates with only a college preparatory curriculum. Controlling for other significant variables such as socioeconomic background, parents' educational attainment, and measured intelligence can reduce the discrepancy but still leaves a residual shortfall (e.g., Rivera-Batiz 1998).

However, another NCES (2000) finding is more encouraging: students with both a vocational concentration *and* a college preparatory curriculum not only outperformed vocational concentrators only but were statistically indistinguishable from those who completed a college preparatory curriculum only. This finding suggests that current reform efforts stressing high content and performance standards for all students in both academic and technical subjects, the integration of academic and career-technical education, and contextualized, work-based learning may indeed point the way to a new CTE with greatly improved learning outcomes.

This view is supported by other research findings. Lewis, Gill, and Lundquist (1996) found that, controlling for differences in measured intelligence, students in secondary and postsecondary programs certified by the National Institute for Automotive Service Excellence scored higher on a test of automotive mechanics knowledge than students in highly similar noncertified programs. Likewise, the negative association between working long hours during high school and grades is decreased by work-based learning programs like co-operative education that create more explicit linkages between school and work (Stern et al. 1997) Finally, the Southern Regional Education Board (SREB) (2000) has documented achievement gains by vocational students at its High Schools That Work sites, with their stress on concentration of courses in vocational studies, a challenging curriculum, increased graduation requirements and academic course-taking, integrated academic and career-technical education, high expectations, and demanding standards.

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